

What is claimed is:

1. A halogen dioxide generating system, comprising:
  - a) a source of an aqueous feed solution comprising a halogen dioxide salt;
  - b) a non-membrane electrolysis cell comprising an anode and a cathode, and having a cell chamber with an inlet and an outlet;
  - c) a means for passing the aqueous feed solution into the chamber and along a passage adjacent to the anode, and out of the outlet; and
  - d) an electric current supply to flow a current through the aqueous feed solution in the passage, to convert a portion of the halogen dioxide salt to halogen dioxide, and thereby form an aqueous effluent comprising halogen dioxide.
2. The halogen dioxide generating system of Claim 1 wherein the anode and the cathode are confronting and co-extensive, with a chamber gap of 0.5 mm or less.
3. The halogen dioxide generating system of Claim 1 wherein the anode is a metallic porous anode.
4. The halogen dioxide generating system of Claim 1, wherein said system is interfaced with an appliance.
5. The halogen dioxide generating system of Claim 4, wherein said appliance is selected from the group consisting of refrigerators, water chillers, water fountains, soda fountains, oral irrigators, water purifiers, water coolers, washing machines, dishwashing machines, coffee makers, faucets and combinations thereof.
6. The halogen dioxide generating system of Claim 4, wherein said system is interfaced with said appliance via connection of a water inlet line to the inlet of said electrolysis cell and connection of an outlet line from the outlet of said electrolysis cell to an inlet of said appliance.
7. The halogen dioxide generating system of Claim 4, wherein said system is interfaced with said appliance via connection of said electrolysis cell between an inlet of said appliance and an outlet of a water-dispensing device of said appliance.

8. The halogen dioxide generating system of Claim 4, wherein said system is interfaced with said appliance via connection of said electrolysis cell between an inlet of said appliance and an outlet of an ice-dispensing device of said appliance.

9. A halogen dioxide generating and re-circulating system, comprising:

- a) a source of an aqueous feed solution comprising a halogen dioxide salt;
- b) a non-membrane electrolysis cell comprising an anode and a cathode, and having a cell chamber with an inlet and an outlet;
- c) a means for passing the aqueous feed solution into the chamber, and along a passage adjacent to the anode, and out of the outlet;
- d) an electric current supply to flow a current through the aqueous solution between the anode and the cathode, to convert at least a portion of the halogen dioxide salt in the passage to halogen dioxide, and thereby form an aqueous effluent comprising halogen dioxide;
- e) a means for delivering the aqueous effluent into contact with a halogen dioxide depletion target, whereby a portion of the halogen dioxide in the aqueous effluent oxidizes the depletion target and reverts back to a halogen dioxide salt; and
- f) a means for returning the depleted effluent comprising the reverted halogen dioxide salt back to the source.

10. The halogen dioxide generating system of Claim 9, wherein said system is interfaced with an appliance.

11. The halogen dioxide generating system of Claim 10, wherein said appliance is selected from the group consisting of refrigerators, water chillers, water fountains, soda fountains, oral irrigators, water purifiers, water coolers, washing machines, dishwashing machines, coffee makers, faucets and combinations thereof.

12. The halogen dioxide generating system of Claim 10, wherein said system is interfaced with said appliance via connection of a water inlet line to the inlet of said electrolysis cell and connection of an outlet line from the outlet of said electrolysis cell to an inlet of said appliance.

13. The halogen dioxide generating system of Claim 10, wherein said system is interfaced with said appliance via connection of said electrolysis cell between an inlet of said appliance and an outlet of a water-dispensing device of said appliance.

14. The halogen dioxide generating system of Claim 10, wherein said system is interfaced with said appliance via connection of said electrolysis cell between an inlet of said appliance and an outlet of an ice-dispensing device of said appliance.